Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A representative sample generating apparatus for generating representative sample data of each of a plurality of groups, based on a plurality of sample data initially classified into said plural groups, said apparatus comprising:

group feature data detection means for determining ~~detecting~~ group feature data representing feature of sample data in said each ~~of said groups~~ group;

distance detection means for detecting the distances between ~~all of~~ the sample data and the group feature data of said each group;

re-classification means for re-classifying all of said sample data into said plurality of ~~plural~~ groups based on said distances;

convergence detection means for detecting whether or not the number of sample data classified into groups different from each previous group ~~groups~~ is converged as a result of said re-classification ~~by said re-classification means~~; and

decision means for repeating the processing by said group feature data detection means, re-classification means, and said convergence detection means until said convergence detection means has detected convergence based on said number of sample data, and for determining the group feature data of said each group prevailing at the time of said convergence as ~~detected by said convergence detection means as~~ representative sample data of said each group.

2. (Original) The representative sample generating apparatus according to claim 1 wherein said group feature data detection means detects an average value of sample data in each group as said group feature data.

3. (Original) The representative sample generating apparatus according to claim 1 wherein said convergence detection means detects convergence when the number of sample data classified into a group different from the previous group is equal to or smaller than a pre-set number.

4. (Original) The representative sample generating apparatus according to claim 1 wherein said distance detection means detects the distance by calculating the correlation of the group feature data of each group with respect to all of sample data.

5. (Original) The representative sample generating apparatus according to claim 1 wherein said sample data is image data.

6. (Original) The representative sample generating apparatus according to claim 5 wherein said group feature data detection means generates group feature data according to the orientation of an image represented by image data.

7. (Currently Amended) A representative sample generating method for generating

representative sample data of each of a plurality of groups, based on a plurality of sample data

initially classified into said plural groups, said method comprising:

a step of determining ~~detecting~~ group feature data representing feature of sample data

in said each ~~of said groups~~ group,

a step of detecting the distances between all of the sample data and the group feature

data of said each group;

a step of re-classifying all of said sample data into said plurality of ~~plural~~ groups based

on said distances;

a step of detecting whether or not the number of sample data classified into groups

different from each previous group ~~groups~~ is converged as a result of said re-classification ~~by

said re-classification step~~; and

a step of repeating the processing by said group feature data detection step, re-

classification step and said convergence detection step until said convergence detection step

has detected convergence based on said number of sample data, and for determining the group

feature data of said each group prevailing at the time of said convergence as ~~detected by said

convergence detection step as~~ representative sample data of said each group.

8. (Original) A recording medium having recorded thereon a computer-controllable

program for generating representative sample data of each of a plurality of groups, based on a

plurality of sample data initially classified into said plural groups, said program comprising:

a step of detecting group feature data representing feature of sample data in each of

said groups,

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a step of detecting the distances between all of the sample data and the group feature data of each group;

a step of re-classifying all of said sample data into said plural groups based on said distances;

a step of detecting whether or not the number of sample data classified into groups different from previous groups is converged as a result of re-classification by said re-classification step; and

a step of repeating the processing by said group feature data detection step, re-classification step and said convergence detection step until said convergence detection step has detected convergence, and for determining the group feature data of each group prevailing at the time of said convergence as detected by said convergence detection step as representative sample data of each group.

9. (Original) A representative sample generating apparatus for generating representative sample data of each of a plurality of groups by classifying said plural sample data, having appended supplementary data indicating respective feature, into said plural groups, said apparatus comprising:

initial classification means for initially classifying said plural sample data into plural groups, based on said supplementary data;

group feature data detection means for detecting group feature data representing feature of said sample data in each of said groups;

distance detection means for detecting the distances between all of the sample data and

the group feature data of each group;

re-classification means for re-classifying all of said sample data into said plural groups based on said distances;

convergence detection means for detecting whether or not the number of sample data classified into groups different from previous groups is converged as a result of re-classification by said re-classification means; and

decision means for repeating the processing by said group feature data detection means, said re-classification means and the convergence detection means until said convergence detection means has detected convergence, and for determining the group feature data of each group prevailing at the time of said convergence as detected by said convergence detection means as representative sample data of each group.

10. (Original) The representative sample generating apparatus according to claim 9 wherein said group feature data detection means detects an average value of sample data in each group as said group feature data.

11. (Original) The representative sample generating apparatus according to claim 9 wherein said convergence detection means detects convergence when the number of sample data classified into a group different from the previous group is equal to or smaller than a pre-set number.

12. (Original) A representative sample generating method for generating

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representative sample data of each of a plurality of groups by classifying said plural sample

data, having appended supplementary data indicating respective feature, into said plural

groups, said method comprising:

a step of initially classifying said plural sample data into plural groups, based on said

supplementary data;

a step of detecting group feature data representing feature of said sample data in each

of said groups;

a step of detecting the distances between all of the sample data and the group feature

data of each group;

a step of re-classifying all of said sample data into said plural groups based on said

distances;

a step of detecting whether or not the number of sample data classified into groups

different from previous groups is converged as a result of re-classification by said re-

classification step; and

a step of repeating the processing by said group feature data detection step, said re-

classification step and the convergence detection step until said convergence detection step

has detected convergence, and of determining the group feature data of each group prevailing

at the time of said convergence as detected by said convergence detection step as

representative sample data of each group.

13. (Original) A recording medium having recorded thereon a computer-controllable

program for generating representative sample data of each of a plurality of groups by

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classifying said plural sample data, having appended supplementary data indicating respective

feature, into said plural groups, said program comprising:

a step of initially classifying said plural sample data into plural groups, based on said

supplementary data;

a step of detecting group feature data representing feature of said sample data in each

of said groups;

a step of detecting the distances between all of the sample data and the group feature

data of each group;

a step of re-classifying all of said sample data into said plural groups based on said

distances;

a step of detecting whether or not the number of sample data classified into groups

different from previous groups is converged as a result of re-classification by said re-

classification step; and

a step of repeating the processing by said group feature data detection step, said re-

classification step and the convergence detection step until said convergence detection step

has detected convergence, and of determining the group feature data of each group prevailing

at the time of said convergence as detected by said convergence detection step as

representative sample data of each group.

14. (Original) A classification apparatus for re-classifying sample data initially

classified into a plurality of groups, said apparatus comprising:

group feature data detection means for detecting group feature data representing

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feature of the sample data for each of said groups;

distance detection means for detecting the distances between all of the sample data and the group feature data of each group;

re-classification means for re-classifying all of said sample data into said plural groups based on said distances;

convergence detection means for detecting whether or not the number of sample data classified into groups different from previous groups is converged as a result of re-classification by said re-classification means; and

decision means for repeating the processing by said group feature data detection means, said re-classification means and the convergence detection means until said convergence detection means has detected convergence, and for determining the results of re-classification of each sample data by said re-classification means on convergence detection by said convergence detection means.

15. (Original) A classification method for re-classifying sample data initially classified into a plurality of groups, said method comprising:

a step of detecting group feature data representing feature of the sample data for each of said groups;

a step of detecting the distances between all of the sample data and the group feature data of each group;

a step of re-classifying all of said sample data into said plural groups based on said distances;

a step of detecting whether or not the number of sample data classified into groups

different from previous groups is converged as a result of re-classification by said re-

classification step; and

a step of repeating the processing by said group feature data detection step, said re-

classification step and the convergence detection step until said convergence detection step

has detected convergence, and of determining the results of re-classification of each sample

data by said re-classification step on convergence detection by said convergence detection

step.

16. (Original) A recording medium having recorded thereon a computer-controllable

program for performing processing of re-classifying a plurality of sample data, based on a

plurality of sample data initially classified into plural groups, said program comprising:

a step of detecting group feature data representing feature of sample data in each of

said groups,

a step of detecting the distances between all of the sample data and the group feature

data of each group;

a step of re-classifying all of said sample data into said plural groups based on said

distances;

a step of detecting whether or not the number of sample data classified into groups

different from previous groups is converged as a result of re-classification by said re-

classification step; and

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a step of repeating the processing by said group feature data detection step, re-

classification step and said convergence detection step until said convergence detection step

has detected convergence, and of determining the results of re-classification of each sample

data by said re-classification step on convergence detection in said convergence detection step

as ultimate results of classification of each of said groups.

17. (Original) A classification apparatus for classifying plural sample data, having

appended supplementary data indicating respective feature, into plural groups, said apparatus

comprising:

initial classification means for initially classifying said plural sample data into plural

groups, based on said supplementary data;

group feature data detection means for detecting group feature data representing

feature of said sample data in each of said groups;

distance detection means for detecting the distances between all of the sample data and

the group feature data of each group;

re-classification means for re-classifying all of said sample data into said plural groups

based on said distances;

convergence detection means for detecting whether or not the number of sample data

classified into groups different from previous groups is converged as a result of re-

classification by said re-classification means; and

decision means for repeating the processing by said group feature data detection

means, said re-classification means and the convergence detection means until said

convergence detection means has detected convergence, and for determining the results of re-classification of each sample data by said re-classification means on convergence detection in said convergence detection step as ultimate results of classification of each of said groups.

18. (Original) A classification method for classifying plural sample data, having appended supplementary data indicating respective feature, into plural groups, said method comprising:

a step of initially classifying said plural sample data into plural groups, based on said supplementary data;

a step of detecting group feature data representing feature of said sample data in each of said groups;

a step of detecting the distances between all of the sample data and the group feature data of each group;

a step of re-classifying all of said sample data into said plural groups based on said distances;

a step of detecting whether or not the number of sample data classified into groups different from previous groups is converged as a result of re-classification by said re-classification step; and

a step of repeating the processing by said group feature data detection step, said re-classification step and the convergence detection step until said convergence detection step has detected convergence, and of determining the results of re-classification of each sample data by said re-classification step on convergence detection in said convergence detection step

as ultimate results of classification of each of said groups.

19. (Original) A recording medium having recorded thereon a computer-controllable program for classifying plural sample data, having appended supplementary data indicating respective feature, into plural groups, said program comprising:

a step of initially classifying said plural sample data into plural groups, based on said supplementary data;

a step of detecting group feature data representing feature of said sample data in each of said groups;

a step of detecting the distances between all of the sample data and the group feature data of each group;

a step of re-classifying all of said sample data into said plural groups based on said distances;

a step of detecting whether or not the number of sample data classified into groups different from previous groups is converged as a result of re-classification by said re-classification step; and

a step of repeating the processing by said group feature data detection step, said re-classification step and the convergence detection step until said convergence detection step has detected convergence, and of determining the results of re-classification of each sample data by said re-classification step on convergence detection in said convergence detection step as ultimate results of classification of each of said groups.

20. (Currently Amended) A coefficient data generating apparatus for generating a coefficient data set adapted for generating sample feature data from new sample data not having sample feature data, based on a database in which there are pre-stored said sample feature data and sample data associated with said sample feature data, said apparatus comprising:

classification means for classifying said sample data into a plurality of classes, based on the relation thereof with representative sample data which is set to each classification and which is associated with the sample feature data;

means for generating, for each class, a normal equation having the values of both of the sample feature data and the sample data as previously known data and having coefficient data as unknown data; and

coefficient data generating means for solving said normal equation based on least square for each class to generate said coefficient data set for each class.

21. (Original) A coefficient data generating method for generating a coefficient data set adapted for generating sample feature data from new sample data not having sample feature data, based on a database in which there are pre-stored said sample feature data and sample data associated with said sample feature data, said method comprising:

a step of classifying said sample data into a plurality of classes, based on the relation thereof with representative sample data which is set to each classification and which is associated with the sample feature data;

a step of generating, for each class, a normal equation having the values of the sample feature data and the sample data as previously known data and having coefficient data as unknown data; and

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a step of solving said normal equation for each class to generate said coefficient data set for each class.

22. (Original) A recording medium having recorded thereon a computer-controllable program adapted for generating a coefficient data set adapted for generating sample feature data from new sample data not having sample feature data, based on a database in which there are pre-stored said sample feature data and sample data associated with said sample feature data, said program comprising:

a step of classifying said sample data into a plurality of classes, based on the relation thereof with representative sample data which is set to each classification and which is associated with the sample feature data;

a step of generating, for each class, a normal equation having the values of the sample feature data and the sample data as previously known data and having coefficient data as unknown data; and

a step of solving said normal equation for each class to generate said coefficient data set for each class.

23. (Currently Amended) A sample feature data generating apparatus comprising:

distance detection means for detecting distance between input sample data and each representative sample data generated previously for each of a plurality of groups;

classification means for classifying said input sample data into one of said classes, based on the distances of said input sample data from representative sample data of said plural groups; and

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sample feature data generating means for generating sample feature data representing the

feature, which is based on orientation, of said input sample data in accordance with a system pre-

set for each class.

24. (Original) The sample feature data generating apparatus according to claim 23

wherein said sample feature data generating means includes

storage means for storing a coefficient data set pre-set for each class;

prediction equation generation generating means for generating a prediction equation

based on the coefficient data set read out from said storage means based on a class determined by

said classification means; and

data generating means for solving said prediction equation to generate said sample

feature data.

25. (Original) The sample feature data generating apparatus according to claim 23

wherein said sample feature data generating means generates sample feature data having

consecutive values on a line interconnecting said plural representative sample data.

26. (Previously Presented) The sample feature data generating apparatus according to

claim 23 wherein said distance detection means detects a distance by calculating the correlation

between input sample data and representative sample data generated initially for each of said

groups.

27. (Original) The sample feature data generating apparatus according to claim 23

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wherein said input sample data is image data.

28. (Original) The sample feature data generating apparatus according to claim 27 wherein said sample feature data generating means generates sample feature data according to the orientation of an image represented by image data.

29. (Original) A sample feature data generating method comprising:

a step of detecting distance between input sample data and each representative sample data generated previously for each of a plurality of groups;

a step of classifying said input sample data into one of said classes, based on the distances of said input sample data from representative sample data of said plural groups; and

a step of generating sample feature data representing the feature of said input sample data in accordance with a system pre-set for each class.

30. (Original) A recording medium having recorded thereon a computer-controllable program adapted for generating sample feature data representing feature of input sample data, said program comprising:

a step of detecting distance between input sample data and each representative sample data generated previously for each of a plurality of groups;

a step of classifying said input sample data into one of said classes, based on the distances of said input sample data from representative sample data of said plural groups; and

a step of generating sample feature data representing the feature of said input sample data in accordance with a system pre-set for each class.

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31. (Original) A data processing apparatus comprising:

a representative sample generating device adapted for repeatedly performing the operations of detecting group feature data based on a plurality of sample data initially classified into a plurality of groups, said group feature data representing feature of sample data in each of said groups, detecting distances between all of the sample data and the group feature data of each group, re-classifying all of said sample data into said plural groups, based on the detected distance, and detecting whether or not the number of sample data classified into groups different from the previous groups has converged, and for determining the group feature data of each group prevailing on detection of the convergence by said re-classification of the number of sample data classified into groups different from the previous group, as representative sample data of each group; and

a sample feature data generating device adapted for detecting the distances of input sample data to representative sample data of each group, classifying said input sample data into one of a plurality of classes, based on the distances of said input sample data to the representative sample data of each group, and for generating sample feature data representing feature of said input sample data in accordance with a system pre-set for each class.

32. (Original) A data processing method comprising:

a representative sample data determining step of repeatedly performing the operations of detecting group feature data based on a plurality of sample data initially classified into a plurality of groups, said group feature data representing feature of sample data in each of said groups, detecting distances between all of the sample data and the group feature data of each group, re-

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classifying all of said sample data into said plural groups, based on the detected distance, and

detecting whether or not the number of sample data classified into groups different from the

previous groups has converged, and for determining the group feature data of each group

prevailing on detection of the convergence by said re-classification of the number of sample data

classified into groups different from the previous group, as representative sample data of each

group; and

a sample feature data generating step of detecting the distances of input sample data to

representative sample data of each group, classifying said input sample data into one of a

plurality of classes, based on the distances of said input sample data to the representative sample

data of each group, and for generating sample feature data representing feature of said input

sample data in accordance with a system pre-set for each class.

33. (Original) A recording medium having recorded thereon a computer-controllable

program adapted for performing the processing of generating sample feature data representing

feature of input sample data, said program comprising:

a representative sample data determining step of repeatedly performing the operations of

detecting group feature data based on a plurality of sample data initially classified into a plurality

of groups, said group feature data representing feature of sample data in each of said groups,

detecting distances between all of the sample data and the group feature data of each group, re-

classifying all of said sample data into said plural groups, based on the detected distance, and

detecting whether or not the number of sample data classified into groups different from the

previous groups has converged, and determining the group feature data of each group prevailing

on detection of the convergence by said re-classification of the number of sample data classified

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into groups different from the previous group, as representative sample data of each group; and

a sample feature data generating step of detecting the distances of input sample data to representative sample data of each group, classifying said input sample data into one of a plurality of classes, based on the distances of said input sample data to the representative sample data of each group, and of generating sample feature data representing feature of said input sample data in accordance with a system pre-set for each class.

34. (New) The coefficient data generating apparatus according to claim 20, wherein said sample feature data is feature data based on orientation.